

REMARKS

I. Drawings

Applicant acknowledges that the drawings filed on January 1, 2002 are accepted by the Examiner.

II. Specification

The Examiner objected to the disclosure because of the following informalities: page 14, line 8, the reference number "65" should be change to -64--. Appropriate correction is required. Applicant has therefore amended the specification as indicated herein to overcome this objection.

III. Claim Rejections of 35 U.S.C. §103

The Examiner quoted the following section of 35 U.S.C. 103 § (a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Examiner rejected claims 1-30 under 35 U.S.C. 103 § (a) as being unpatentable over Urayama et al (JP-40-5217881 A) in view of Nakano et al (6,613,588). Regarding claims 1 and 17, the Examiner argued that Urayama et al discloses a resist coater with an evaluation unit for detecting dust quantity of resist film on the wafer which has all the features of the present invention, except that the coating device is automatically terminated when the amount of the dust is exceeded a predetermined level.

The Examiner further argued, however, that such a feature is known in the art as taught by Nakano et al. The Examiner asserted that Nakano et al teaches the plasma processing device with a particle detention optical system in which the etching operation can be halted if the total number of particles generated exceeds a reference value (column 9, lines 21-27 and column 18, lines 44-52). The Examiner therefore argued that it would have been obvious to one having ordinary skill in the art to include in Urayama et al a terminating system as taught by Nakano et al. The Examiner argued that the rationale for this modification would have arisen from the fact that using such system would alert the operator know when the processing chamber need to be cleaned or maintenance.

The Applicant respectfully disagrees with this assessment. Applicant's claim 1 is directed toward a method for detecting contaminants during a semiconductor fabrication operation involving a semiconductor coating device, comprising the steps of: generating a beam of laser light from a laser light source attached to at least one coater cup associated with the semiconductor coating device utilized in the semiconductor fabrication operation; and automatically terminating the semiconductor fabrication operation, in response to detecting the contaminants utilizing the beam of laser light, wherein the contaminants are scattered as a result of the semiconductor fabrication operation.

Similarly, Applicant's claim 17 is directed toward a system for detecting contaminants during a semiconductor fabrication operation involving a semiconductor coating device, comprising: a laser light source attached to at least one coater cup associated with the semiconductor coating device utilized in the semiconductor fabrication operation, wherein the laser light source generates a beam of laser light; and a laser detector for detecting contaminants utilizing the beam of laser light, such that the contaminants are scattered as a result of the

semiconductor fabrication operation, wherein the semiconductor fabrication operation is automatically terminated, in response to detecting the contaminants utilizing the beam of laser light. automatically terminating the semiconductor fabrication operation, in response to detecting the contaminants utilizing the beam of laser light, wherein the contaminants are scattered as a result of the semiconductor fabrication operation.

Urayama et al does not teach either all of the aforementioned elements taught by Applicants' claims 1 and 17. The Examiner has merely set forth a statement that Urayama et al discloses a resist coater with an evaluation unit for detecting dust quantity of resist film on the wafer which has all the features of the present invention, without properly identifying or citing appropriate sections of Urayama et al which disclose or teach the features of Applicant's claims 1 and 17. For example, Urayama et al does not teach, suggest or disclose a laser light source attached to at least one coater cup. Note that the term "at least one coater cup" is utilized to indicate "one or more coater cups". Urayama et al refers only to a resist coater with an evaluation unit. Urayama et al does not teach or suggest a laser light source attached to one or more coater cups. Additionally, the laser source 10 of Urayama et al is not attached to one or more coater cups.

Urayama et al does also des not disclose automatically terminating the semiconductor fabrication operation, in response to detecting the contaminants utilizing the beam of laser light, wherein the contaminants are scattered as a result of the semiconductor fabrication operation. Scattering of contaminants is not taught by Urayama et al alone and/or in combination with Nakano et al. A solution for scattering of contaminants is also not taught by Urayama et al alone and/or in combination with Nakano et al.

The Examiner argued that it would have been obvious to one having ordinary skill in the art to include in Urayama et al a terminating system as taught by Nakano et al. The Examiner asserted that Nakano et al teaches the plasma processing device with a particle detention optical system in which the etching operation can be halted if the total number of particles generated exceeds a reference value (column 9, lines 21-27 and column 18, lines 44-52). Column 9, lines 21-27 and column 18, lines 44-52 do not teach or suggest, however, automatically terminating the semiconductor fabrication operation, in response to detecting the contaminants utilizing the beam of laser light, wherein the contaminants are scattered as a result of the semiconductor fabrication operation. In fact, as indicated at col. 26, lines 25-39, Nakano et al teaches a method for detecting particles suspended in a plasma processing apparatus, which is a device that is much different than the device taught and disclosed by Applicant's claims 1 and 17.

Applicant does not teach or suggest a plasma processing apparatus. In fact, the use of plasma as a semiconductor processing method and/or system teaches away from the use of coater cups, because the use of such cups cannot be properly adapted to plasma processing operations, which would in fact damage the photoresist and coater cups utilized therein. Thus, it would be improper to combine a plasma etching reference with a reference that utilizes coater cups, because such cups would likely be damaged by the plasma processing apparatus disclosed by Nakano et al. The Examiner is therefore incorrect in arguing that the rationale for this modification would have arisen from the fact that using such system would alert the operator know when the processing chamber need to be cleaned or maintenance, because in fact, a plasma processing chamber would tend to damage the use of coater cups and photoresist (PR) cups.

Regarding claims 2, 5 and 19, the Examiner cited the abstract of Urayama et al for laser generator (10). The Applicant respectfully disagrees with this assessment. Regarding claim 1, the Applicant points out that the abstract of Urayama et al teaches detecting scattered light from the rear surface of the monitor substrate (9) by means of a light receiving unit. This component differs from the features of claim 2, which are directed toward detecting contaminants utilizing the beam of laser light. The actual beam of laser light is used to detect the contaminants, not a light receiving unit. Regarding claims 5 and 19, neither Urayama et al and/or Nakano et al, alone or combination with one another, teach, suggest or disclose the use of an edge emitting laser or a solid state semiconductor light emitter. Additionally, it would not have been obvious to one of ordinary skill in the art to use an edge emitting laser or a solid state semiconductor light emitter because such devices are not employed in semiconductor processing operations.

Regarding claim 3, the Examiner argued that the laser source is attached to the coater cup (citing figure 1). Applicant respectfully disagrees with this assessment. It is not clear from figure 1 of Urayama et al that laser source 10 is attached to a coater cup. In fact, laser source 10 is located a distance from substrate 9 and light receiving unit 11. It therefore appears from Figure 1 of Urayama et al that laser source 10 is not attached to the coater cup.

Regarding claims 4 and 18, the Examiner referred to Urayama's abstract for resist coater. Applicant respectfully disagrees with this assessment. Urayama does not teach, disclose or suggest a photoresist (PR) cup. A resist coater is a device much different than a PR cup. The use of a PR implies "photo" semiconductor processes. Urayama et al does not teach, disclose or suggest "photo" semiconductor and hence, photoresist (PR) techniques.

Regarding claims 6, 7, 12-13, 20-21, 26-27, the Examiner referred to Urayama's abstract for a laser source (10) and a laser detector (11). The Applicant respectfully disagrees with this assessment. Regarding claims 6 and 20, Urayama et al does not teach, disclose or suggest an edge emitting laser or a solid state semiconductor light emitter. In particular, Urayama et al does not teach, disclose or suggest a semiconductor processing system which incorporates an edge emitting laser or a solid state semiconductor light emitter. Regarding claims 7 and 21, Urayama's abstract does not teach, suggest or disclose a laser light source that comprises a laser generator integrated with a laser detector.

Urayama et al instead teaches and discloses a separate laser source (10) and a separate laser detector (11). Regarding claims 12-13 and 26-27, Applicants teach detecting contaminants utilizing at least one laser detector to detect said beam of laser light generated from said laser light source, and wherein said laser light source is generated by at least one laser generator. The term "at least one" is equivalent to the term "one or more". Therefore Applicants teach one or more laser detectors and one or more laser generators. Urayama shows only one light source 10 and only one light receiving unit 11, not more than one of such units.

Regarding claims 8 and 22, the Examiner cited figure 1 of Urayama for spindle (15), Applicant notes that the neither the abstract of Urayama et al nor reference numeral 15 refer to a spindle. It is not clear that a wafer spin coating operation is evident by Figure of Urayama et al.

Regarding claims 9 and 23, the Examiner cited Urayama's abstract for detecting dust. The Applicant asserts that it is irrelevant that Urayama's device detects dust, because Urayama et al. does not teach all of the features and elements of Applicant's claims 1 and 17.

Regarding claims 10, 11, and 24-25, the Examiner argued that it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the particle detection system of Urayama et al for detecting the photoresist dust as a result of a wafer spin coating operation because the device would function in the same manner. The Applicant disagrees with this assessment, because the device of Urayama et al would not function in the same manner, considering that Urayama does not teach "photoresist" but rather "resist" material, which is a fundamental difference. Additionally, Urayama et al does not teach, disclose or suggest all of the features of the claims from which claims 10, 11, and 24-25 depend.

Regarding claims 14-16 and 28-30, the Examiner admitted that Urayama et al does not explicitly teach the use of a transparent coater cup. The Examiner argued, however that it would have been obvious to one of ordinary skill in the art to use a transparent coater cup because no matter what type of material of cup the device would function in the same manner. The Applicant respectfully disagrees with this assessment. The use of a transparent coater cup would not have been obvious to one of ordinary skill in the art because the device does not function in the same manner. The use of a transparent material would enable the operator to more accurately view the activities within the coater cup while providing a clearer view of dust or accumulation on the coater cup itself. The operator could in fact stop the manufacturing operations if too much accumulation is seen on or within the transparent coater cup. This is the reason transparent coater cups have not been utilized to date. Additionally, Applicant points out that neither the Nakano et al reference or the Urayama et al reference teach, suggest, or disclose, alone or in combination without one another, the use of a transparent coater cup. The Examiner should provide a reference or cite to appropriate portions of Urayama et

al and/or Nakano et al, which actually teach or disclose the use of a transparent coater cup.

The Applicant notes that Examiner has not provided a motivation for combining Urayama et al with Nakano et al to teach all of the features taught by Applicants' claims. The Applicants remind the Examiner that the references may not be taken out of context and combined without motivation, in effect producing the words of the claims (and sometimes, not even the words or concepts of the claims), without their meaning or context. The resultant combination would not yield the invention as claimed. The claims are rejected under 35 U.S.C. 103 and no showing has been made to provide the motivation as to why one of skill in the art would be motivated to make such a combination, and further fails to provide the teachings necessary to fill the gaps in these references in order to yield the invention as claimed.

The rejection under 35 U.S.C. 103 has provided no more motivation than simply to point out the individual words of the Applicants' claims among the references, but without the reason and result as provided in the Applicants' claims and specification, and without reason as to why and how the references could provide the Applicants' invention as claimed. Hindsight cannot be the basis for motivation, which is not sufficient to meet the burden of sustaining a 35 U.S.C. 103 rejection.

Thus, claims 1-30 of the present invention are not taught or suggested by Urayama et al and/or Nakano et al, alone or in combination with one another. Combining these references fails to teach or yield the invention as claimed. The combination of these references fails to teach or suggest all the elements of the claims. Further, one of skill in the art would not be motivated to make such a

combination. Therefore, the present invention is not obvious in light of any combination of Urayama et al and/or Nakano et al. Withdrawal of the §103 rejections is therefore respectfully requested.

IV. Prior Art Made of Record

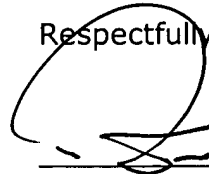
The Examiner also argued that the prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Examiner indicated that the following references relate to dust inspection device or photoresist coater cup: JP-11-306646, Yonaha (6,251,487), Sato (5,993,547), and Fujimoto (5,939,139). Applicant notes that such references do not teach transparent coater cups, PR cups, edge emitting lasers, solid state semiconductor light emitters and/or laser generators integrated with laser detectors.

V. Conclusion

In view of the foregoing discussion, the Applicant has responded to each and every rejection of the Official Action. The Applicant has clarified the structural distinctions of the present invention by amendments herein. The foregoing discussion and amendments do not present new issues for consideration and that no new search is necessitated. Such amendments are supported by the specification and do not constitute new matter. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. §103, and further examination of the present application.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned representative to conduct an interview in an effort to expedite prosecution in connection with the present application.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'Randy Tung', is written over a horizontal line. The signature is stylized with a large loop at the beginning and a cross-like shape at the end.

Randy Tung
Registration No. 31,311